

What is claimed is:

1. A seat belt retractor for winding and unwinding a seat belt, comprising:

a spool for winding and unwinding the seat belt,

5 a locking mechanism having a locking member attached to the spool to be rotatable therewith in a normal state and capable of locking the spool in an emergency state, and

an energy absorbing mechanism disposed between the spool and the locking member for absorbing impact energy applied on an
10 occupant when the locking member is locked in the emergency state and the spool rotates in a direction of unwinding the seat belt relative to the locking member, said energy absorbing mechanism including an energy absorbing member with an elongated form having various widths provided in one of the spool and the
15 locking member and deforming means provided in the other of the spool and the locking member for deforming the energy absorbing member, said energy absorbing member rotating with the spool in the direction of unwinding the seat belt relative to the locking mechanism in the emergency state so that the deforming means
20 deforms the energy absorbing member to restrict a load applied to the seat belt and absorb the impact energy.

2. A seat belt retractor according to claim 1, wherein said deforming means is an arc groove and is arranged such that the
25 energy absorbing member passes through the groove and is forced to deform when the energy absorbing member rotates with the spool in the direction of unwinding the seat belt in the emergency state.

3. A seat belt retractor according to claim 1, further comprising a torsion bar disposed between the spool and the locking member for connecting therebetween and capable of being deformed when the locking member is locked and the spool rotates
5 relative to the locking member.

4. A seat belt retractor for winding and unwinding a seat belt, comprising:

a cylinder member capable of rotating for winding and
10 unwinding the seat belt,

a shaft member disposed inside the cylinder member and having one end connected to the cylinder member to be rotatable therewith,

a plate fitting member disposed inside the cylinder member
15 at an end portion thereof and connected to the other end of the shaft member to be rotatable therewith,

a locking mechanism disposed adjacent to the plate fitting member for locking the same, and

a plate member capable of deforming plastically and having
20 one end attached to the plate fitting member and the other end engaging the cylinder member.

5. A seat belt retractor according to claim 4, wherein said shaft member is made deformable inside the cylinder member, and
25 said plate member deforms plastically when the cylinder member rotates relative to the shaft member.

6. A seat belt retractor according to claim 4, wherein said cylinder member has a main cylinder portion for winding the seat
30 belt, and a thick cylinder portion formed at said other end and

having an external diameter larger than that of the main cylinder portion, said plate fitting member having a substantially disk shape, and said plate member being connected to an outside of the plate fitting member in the disk shape at the one end and having the other end engaging an inner surface of the thick cylinder portion.

7. A seat belt retractor according to claim 6, wherein said plate member is arranged such that the other end thereof engaging the inner surface of the thick cylinder portion is disengaged from the thick cylinder portion at a predetermined time after the cylinder member rotates relative to the plate fitting member.

8. A seat belt retractor according to claim 6, wherein said plate fitting member includes a thin portion having a radius smaller than that of other portion thereof so that a distance between the plate member and the thick cylinder portion increases when the plate member is wound around the thin portion.

9. A seat belt retractor according to claim 6, wherein said plate member has a narrow portion at a side of the other end having a width smaller than that of other portion.

10. A seat belt retractor according to claim 6, wherein said thick cylinder portion of the cylinder member has a projection projecting inwardly, and said plate member has the other end abutting against the projection.

11. A seat belt retractor according to claim 10, wherein said projection has a contact end surface at one side thereof in a circumferential direction for abutting against the other end of the plate member.

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12. A seat belt retractor according to claim 10, wherein said projection has a contact end surface at one side thereof in a direction that the cylinder member rotates relative to the plate fitting member for abutting against the other end of the plate member so that the plate member is urged in the direction that the cylinder member rotates relative to the plate fitting member until a predetermined time after the cylinder member starts to rotate relative to the plate fitting member, and the other end separates from the contact end surface after the predetermined time.

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13. A seat belt device comprising the seat belt retractor according to claim 1, the seat belt disposed in the seat belt retractor and having an end connected to an auto body, a buckle fixed to the auto body, and a tongue slidably fitted to the seat belt and capable of engaging the buckle.

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14. A seat belt device comprising the seat belt retractor according to claim 4, the seat belt disposed in the seat belt retractor and having an end connected to an auto body, a buckle fixed to the auto body, and a tongue slidably fitted to the seat belt and capable of engaging the buckle.

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